

WHAT IS CLAIMED:

1. A method for abatement of volatile organic compounds (VOC) in an exhaust gas stream that comprises passing an exhaust gas stream through a pulsed corona discharge chamber in the presence of a spray of water droplets or water film to form one or more oxidation products that dissolve in the water spray droplets or film and provide an effluent water stream and an effluent gas stream, wherein

(a) said pulsed corona discharges at a rate of about 0.01 to about 2 kHz,

(b) the ratio of the water spray rate to the exhaust gas flow is about 0.2 to about 2 milliliters/minute at one standard liter per minute of exhaust gas flow, and

(c) an expenditure of not more than 50 eV per molecule of VOC is utilized,

said method providing a destruction and removal efficiency of about 90 percent or more, thereby abating said VOC.

2. The method according to claim 1 wherein said exhaust gas stream is passed through a pulsed corona discharge chamber in the presence of a spray of water droplets.

3. The method according to claim 1 wherein said pulsed corona discharges at a rate of about 0.1 to about 1 kHz.

4. The method according to claim 1 wherein said exhaust gas stream contains about 60 to about 6000 ppm VOC.

5. The method according to claim 1 wherein said exhaust gas stream is that produced from a process selected from the group consisting of papermaking, metal cleaning or plating, paint manufacturing, plastics manufacture, petroleum refining and dye-making.

6. A method for abatement of volatile organic compounds (VOC) in an exhaust gas stream that comprises passing an exhaust gas stream produced from a process selected from the group consisting of papermaking, metal cleaning or plating, paint manufacturing, plastics manufacture, petroleum refining and dye-making and contains about 60 to about 6000 ppm VOC through a pulsed corona discharge chamber in the presence of a spray of water droplets to form one or more oxidation products that dissolve in the water spray droplets and provide an effluent water stream and an effluent gas stream, wherein

(a) said pulsed corona discharges at a rate of about 0.1 to about 1 kHz,

(b) the ratio of the water spray rate to the exhaust gas flow is about 0.2 to about 2 milliliters/minute at one standard liter per minute of exhaust gas flow, and

(c) an expenditure of not more than 50 eV per molecule of VOC is utilized,

said method providing a destruction and removal efficiency of about 90 percent or more, thereby abating said VOC.

7. The method according to claim 6 wherein said method is carried out at an exhaust stream temperature of about 40° C to about 65° C.

8. The method according to claim 6 wherein said exhaust stream contains about 200 to about 4200 ppm VOC.

9. The method according to claim 6 wherein said exhaust stream is produced from a papermaking process.

10. A method for abatement of volatile organic compounds (VOC) in an exhaust gas stream that comprises passing an exhaust gas stream at a temperature of about 40° C to about 65° C produced from a papermaking process that contains about 200 to about 4200 ppm VOC through a pulsed corona discharge chamber in the presence of a spray of water droplets to form one or more oxidation products that dissolve in the water spray droplets and provide an effluent water stream and an effluent gas stream, wherein

(a) said pulsed corona discharges at a rate of about 0.1 to about 1 kHz,

(b) the ratio of the water spray rate to the exhaust gas flow is about 0.2 to about 2 milliliters/minute at one standard liter per minute of exhaust gas flow, and

(c) an expenditure of not more than 50 eV per molecule of VOC is utilized,

said method providing a destruction and removal efficiency of about 90 percent or more, thereby abating said VOC.

11. The method according to claim 10 wherein said exhaust stream contains about 300 to about 3000 ppm VOC.

12. The method according to claim 10 wherein said removal efficiency is about 99 percent or more.

13. The method according to claim 10 wherein said papermaking process is brownstock or oriented strandboard production.

14. The method according to claim 10 including the further step of admixing the effluent water stream containing oxidized VOC with another waste water stream.

15. The method according to claim 10 wherein the water of said water spray is provided from waste water of said papermaking process.